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EXAMINER	
HO, THOMAS M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/620,462	Applicant(s) SHIM, JAE-SEONG	
	Examiner Thomas M Ho	Art Unit 2134	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Claims 1-46 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "optical disc" in line 5. There is insufficient antecedent basis for this limitation in the claim. The preamble to the claim merely states "a data scrambler for a high density optical recording/reproducing apparatus, the data scrambler comprising."

For the purposes of examination, claim 1 shall be read as "a data scrambler for a high density optical recording/reproducing apparatus using an optical disk, the data scrambler comprising..."

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 17-19, 41-46 are rejected as being anticipated by Matsui, US patent 5,661,707.

In reference to claim 1:

Matsui (Column 8, lines 45-47) discloses a data scrambler for a high density optical recording/reproducing apparatus, the data scrambler comprising:

a random data generator which generates random data having a random data generation cycle based on a result obtained by multiplying at least a size of a first data frame by a result obtained by dividing a data amount of two tracks in an outermost circumference of the optical disc by a size of a second data frame,

where the random data generator is understood to be apart of the scrambling unit, and the cycle of the scrambling unit is based on the size of the sector(Column 8, lines 55-60, Bsect), or the first data frame, multiplied with the number of sectors in the two outermost tracks (Smax + 1), divided by a second data frame Mloop.

In reference to claim 2:

Matsui(Column 8, lines 45-47) and Matsui(Column 8, lines 19-21) discloses the data scrambler of claim 1, wherein the size of the first data frame is one sector, and the size of the second data frame is one error correction block, where the first data frame is the size of one sector, and the size of the second data frame is Mloop, which is the number of

times a signal can be repeated continuously, correlating to the block scrambling method in which block size is determined by the size of the error control block.

Applicant cites this on page 2:

"The cycle of random data generation of the random data generator in Fig. 2 is 32K and matches the 32K size of 1 error correction code block (ECC) block of a DVD.

In reference to claim 3:

Matsui(Column 8, lines 45-67) discloses the data scrambler of claim 1, wherein the random data generation cycle is at

least as great as the result obtained by multiplying at least the size of the first data frame by the result obtained by dividing the data amount of the two tracks in the outermost circumference of the optical disc by the size of the second data frame as such:

Cycle = (2^x – 1)/8 * Bsect

And the cycle is at least as great as or (greater than) as shown here

(Smax/ Mloop) + 1/Dw * Dw < Cycle.

By substituting the first computation of cycle into the inequality, we get

(Smax/ Mloop) + 1/Dw * Dw < (2^x – 1)/(8 * Bsect)

multiplying both sides by Bsect, we get

(Bsect)(Smax/Mloop) + 1/Dw * Dw < (2^x –1)/8

The formula disclosed by

Cycle = (2^x – 1)/8 * Bsect Matsui(Column 6, lines 65-67) is the cycle in units of sectors. Since Bsect is the number of information signal bytes contained in one sector, by

removing this value from the computation of the cycle, you are now expressing the cycle, not in units of sector, but in length of data.

This formula, which we compute from Matsui,

(Bsect)(Smax/Mloop) + 1/Dw * Dw < (2^x –1)/8, thereby expresses the following the random generation cycle is at least as great as (<, <=), the result obtained by multiplying Bsect, the size of the first data frame where the first data frame is the size of a sector, obtained by dividing the data amount of the two tracks in the outermost circumference which = Smax, by the size of an error correction block, which is the second frame, Mloop.

Claim 17 is rejected for the same reasons as claim 1.

Claim 18 is rejected for the same reasons as claim 2.

Claim 19 is rejected for the same reasons as claim 3.

Claims 41, 43, 46 are rejected for the same reasons as claim 1.

Claims 42, 44 are rejected for the same reasons as claim 2.

Claim 45 is rejected for the same reasons as claims 2 and 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4-16, 20-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsui and the ECMA-267 standard for 120mm DVD ROMs..

In reference to claim 4:

Matsui does not explicitly disclose the data scrambler of claim 1, wherein the random data generator comprises:

- registers, serially arranged, which shift-store n bits and generate random data, and uses a total of n values as initial values, including a first initial value, first register values, which are output after shifting the first initial value 7 times, a second initial value immediately after a capacity required for return of the first initial value and the first register values, and second register values which are output after shifting the second initial value 7 times; and
- a first serial logic circuit having a plurality of logic gates, which exclusive-OR outputs ones of the registers which correspond to a number of effective branches with a predetermined branch value, and outputs of neighboring ones of the logic gates are fed back to a least significant one of the registers, wherein the data scrambler further comprises a second logic circuit which scrambles outputs of a predetermined number of least significant ones of the registers and input data in units of byte.

Applicant discloses in Fig. 2., a prior art random data generator for use in a scrambling unit.

Fig. 2 Prior art discloses registers, serially arranged, which shift store n bits and generate random data, using a total of n values as initial values, where the initial values may be seeds to the RNG, or the actual data which is to be scrambled. The registers are also expected to store initial register values, usually initialized to expected values by the scrambling mechanism. This is disclosed in paragraph 3 of the background of the invention. And additional example is disclosed in ECMA-267, Section 17.

The examiner takes official notice that having a serial logic circuit having a plurality of logic gates, which exclusive-or outputs one of the registers corresponding to a number of effective branches with a predetermined branch value, and outputting the neighboring ones of the logic gates which are fed back to a least significant one of the registers, wherein the data scrambler further comprises a second logic circuit which scrambles and outputs a predetermined number of least significant ones of the registers and input data in units of byte was well known in the art at the time of invention.

This is disclosed in Fig.2, as prior art by the applicant, and furthermore disclosed by Section 17 of ECMA 267.

It would have been obvious to one of ordinary skill in the art at the time of invention to have a random data generator comprise registers, serially arranged, shift-storing n bits, and scrambling the outputs of a predetermined number of least significant

ones of the registers, wherein the data scrambler further comprises a second logic circuit which scrambles outputs of a predetermined number of least significant ones of the registers and input data in units of byte, given that it is disclosed in ECMA-267, the 120mm DVD ROM standard and is therefore the expected method in which a DVD-ROM scrambler should work –that is, creating a single scramble byte and repeating it 2047 times (2k-1), and XORing it with the data given in units of bytes. (2 kilobytes in the case of ECMA-267)

In reference to claim 5:

Matsui in view of the rejection of claim 4 discloses all of claim 5 except

The data scrambler wherein the random data generation cycle is 2^16 = 64K when n is 16.

It is known in the art that the standard random data generation cycle is typically 32K. Applicant additionally discloses this in the background of the invention page 3, paragraph 4.

High density DVD's contain twice as much data per side. (ECMA-267 type C , Section 6)

The purpose of having the random data generation cycle at all is scramble the data so that adjacent tracks do not repeating values. This in turn allows for better tracking control. Because a standard single sided regular density DVD requires 32K for a random data generation cycle in scrambling, it would have been obvious to one of ordinary skill in the art at the time of invention to require a scrambler of a High density DVD with twice as

much data, to require a random data general cycle to be twice as long, or 32K as opposed to 64K.

In reference to claim 6:

While Matsui does not explicitly disclose an set of initial values for set of registers or scrambling device to be initialized with, it is known in the art that effective branch or first register values must be preset to some hexadecimal value. ECMA 267 Section 17, for example discloses in table 3, a set of values for initialization.

It would have been obvious to one of ordinary skill in the art at the time of invention to disclose any set of hexadecimal initialization values given that the branch values and first register values would have to be preset to something.

Claims 7, 10, 11, 14 are rejected for the same reasons as claim 6.

In reference to claim 8:

Matsui and ECMA-267 fails to explicitly disclose a data scrambler in which
A first initial value and register values are supplied 4K times left-shifting of the first initial value.
However in the case of a HD DVD, which contains twice as much data as a DVD (ECMA-267 type C , Section 6), it would expected that each sector would contain 4K bytes instead of 2K bytes.

The reason why the initial values and register values were shifted 2K times in the (ECMA-267 Section 17) scrambling system is because for each sector of data, a scrambling block of corresponding size must be produced. While the 8bit shift is repeated 2047 times(2k) times for a standard DVD, it would logically be repeated 4k times for a High density DVD, to provide an adequate size scrambling block to scramble a single sector.

It would have been obvious to one of ordinary skill in the art at the time of invention to have the n values as initial values, including a first initial value and register values supplied in each 4K times left-shifting of the first initial value, in a High density DVD, in order to scramble each sector.

Claim 9 is rejected for the same reasons as claim 5.

In reference to claim 12:

Matsui fails to explicitly disclose the data scrambler of claim 1, wherein the random data generator changes the effective branch value in units of a first cycle and generates a second cycle of the random data according to a control value.

(Section 17 and Section 18 of ECMA-267) discloses a random data generator changing the effective branch value in units of a first cycle, where the first cycle is an ECC block, and the branch value is changed when the 16 values of the shift registers need to be "reseeded".

A second cycle of the random data is generated according to the control values, the initial seed values, as depicted in Table 3.

It would have obvious to one of ordinary skill in the art at the time of invention to devise a data scrambler, wherein the random data generator changes the effective branch value in units of a first cycle and generates a second cycle of the random data according to a control value, because it is disclosed by the ECMA-267, the 120mm DVD ROM standard and is therefore the method in which a DVD-ROM scrambler would be expected to should work.

In reference to claim 13:

(Section 17 and Section 18 of ECMA-267) discloses a data scrambler where the first cycle corresponds to an ECC block, and the second cycle corresponds to a sector, where the first cycle branch is changed when the initial pre-set values need to be reseeded, and the second cycle corresponds to the one sector of data (for k = 0 to 2047)

Claim 13 is rejected for the same reasons as claim 12.

In reference to claim 15:

Claim 15 is rejected for the same grounds as claim 4, the embodiment of claim 4 only lacking a decoder which supplies 12 output bits.

It would have been obvious to one of ordinary skill in the art to use a twelve bit decoder, rather than a 15 or 16 bit decoder as a matter of design choice.

In reference to claim 16:

Matsui fails to disclose a data scrambler where initial values of the registers are newly set in each error correction block.

(ECMA-267 Section 17) discloses a data scrambler where initial values of the registers are newly set in each error correction block, where each initial value is set as byte 0 of the 2047 bytes that will be scrambled and set into the ECC block.

It would have been obvious to one of ordinary skill in the art the have the initial values of the registers set in each error correction block, since it is the same method as disclosed in ECMA-267, the 120 mm DVD-ROM standard, and consequently would be expected by all members of DVD consortium that adhere to the standard.

In reference to claim 23:

Although Matsui does not explicitly set sizes for the first data frame, the second data frame, or even the amount of data in the two tracks of the outermost circumference, it would have been obvious to one of ordinary skill in the art, that an optical disk, and the size of a first data frame(the sector), and the size of the second data frame(the error correction block), may be set to any given value, provided that a manufacturer desired to support optical discs with those specific preset frame sizes.

Claims 24 and 25 are rejected for the same reasons as claim 23.

Claim 26 is rejected for the same reasons as claim 5.

In reference to claim 27:

Matsui discloses all of claim 27 except a data scrambler wherein:

(ECMA 267 Section 17) discloses a data scrambler wherein the initial values are determined by an upper 4 bits of a last byte in a 4 byte identification code which is allocated in each of a plurality of the first data frames.

"The initial preset values of the shift register is equal to the value represented by bits b7 to b4 of the ID field of the data frame" The 4-byte ID field is disclosed in Figure 16 of Section 16 of ECMA-267

It would have been obvious to one of ordinary skill in the art at the time of invention to determine the initial values for the data scrambler as disclosed by applicant, since it is the same method as disclosed in ECMA-267, the 120 mm DVD-ROM standard, and consequently would be expected by all members of DVD consortium that adhere to the standard.

Claims 28, 29, 34, 35 are rejected for the same reasons as claim 27.

Claims 21, 33, 36 are rejected for the same reasons as claim 8.

Claims 20, 22, 30, 31, 32, 37, 38, 39, 40 are rejected for the same reasons as claim 4.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas M Ho whose telephone number is (703)305-8029. The examiner can normally be reached on M-F from 8:30am – 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory A. Morse can be reached at (703)308-4789. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-7239 for regular communications and (703)746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-5484.

TMH

March 29th 2004

GREGORY MORSE
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